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Reaffirmed 1986

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Indian Standard "RE-AFFIRMED 1995"

SPECIFICATION FOR FREQUENCY
WEIGHTING FOR THE MEASUREMENT OF
AIRCRAFT NOISE (D-WEIGHTING)

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SPECIFICATION FOR FREQUENCY WEIGHTING FOR THE MEASUREMENT OF AIRCRAFT NOISE (D-WEIGHTING)

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Indian Standard

SPECIFICATION FOR FREQUENCY WEIGHTING FOR THE MEASUREMENT OF AIRCRAFT NOISE (D-WEIGHTING)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 27 October 1980, after the draft finalized by the Acoustics Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 A special frequency weighting has been found useful for certain measurements of aircraft noise. This standard has been specially prepared for use in conjunction with 'Indian Standard procedure for describing aircraft noise heard on the ground (*under preparation*)' on aircraft noise measurements.

NOTE — Till such time the standard under preparation is published, the matter shall be as agreed between the concerned parties.

0.3 Adherence to this standard will ensure minimum variations in measurement results obtained using equipment of various makes and models. A special equipment that has a D-weighting characteristic as defined in the standard and otherwise complies with IS : 3932-1966* has been accepted for the measurement of aircraft noise.

0.4 While preparing this standard, assistance has been derived from IEC Pub 537-1976 'Frequency weighting for the measurement of aircraft noise (D-weighting)' issued by the International Electrotechnical Commission.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Specification for sound level meters for general purpose use.

†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard defines a weighting characteristic which is designated D and is useful for certain measurements of aircraft noise.

2. TERMINOLOGY

2.1 For the purpose of this standard, the terms and definitions given in IS : 1885 (Part III) * shall apply.

3. CHARACTERISTICS

3.1 The D-response is obtained with the combination of poles and zeros in the complex frequency plane given in Table 1. The relative frequency response with tolerance corresponding to this pole-zero configuration is given in Table 2. The reading of an instrument that includes D-weighting shall be identical to sound pressure level at 1 kHz.

TABLE 1 CO-ORDINATES OF THE POLES AND ZEROS OF THE TRANSFER FUNCTION, IN THE COMPLEX FREQUENCY PLANE

POLES (Magnitude is resonant frequency in Hz)	ZEROS (Magnitude is resonant frequency in Hz)
(1)	(2)
$-282.7 + j 0$	$-519.8 + j 876.2$
$-1 160.0 + j 0$	$-519.8 - j 876.2$
$-1 712 + j 2 628$	$0 + j 0$
$-1 712 - j 2 628$	

*Electrotechnical vocabulary : Part III Acoustics.

TABLE 2 FREQUENCY RESPONSE AND TOLERANCES

(Clause 3.1)

FREQUENCY (1) (Hz)	RELATIVE RESPONSE (2) (dB)	TOLERANCE (3) (dB)
10	- 26.6	+ 3.0 - 00
12.5	- 24.6	+ 3.0 - 00
16	- 22.6	+ 3.0 - 00
20	- 20.6	± 3.0
25	- 18.7	± 2.0
31.5	- 16.7	± 1.5
40	- 14.7	± 1.5
50	- 12.8	± 1.5
63	- 10.9	± 1.5
80	- 9.0	± 1.5
100	- 7.2	± 1.0
125	- 5.5	± 1.0
160	- 4.0	± 1.0
200	- 2.6	± 1.0
250	- 1.6	± 1.0
315	- 0.8	± 1.0
400	- 0.4	± 1.0
500	- 0.3	± 1.0
630	- 0.5	± 1.0
800	- 0.6	± 1.0
1 000	0.0	± 1.0
1 250	2.0	± 1.0
1 600	4.9	± 1.0
2 000	7.9	± 1.0
2 500	10.4	± 1.0
3 150	11.6	± 1.0
4 000	11.1	± 1.0
5 000	9.6	± 1.5
6 300	7.6	+ 1.5 - 2.0
8 000	5.5	+ 1.5 - 3.0
10 000	3.4	+ 2.0 - 4.0
12 500	1.4	+ 3.0 - 6.0
16 000	- 0.7	+ 3.0 - 00
20 000	- 2.7	+ 3.0 - 00

INDIAN STANDARDS

ON

ACOUSTICS

IS:

- 1301-1958 Code of safety requirements for electric mains-operated audio amplifiers
- 1490-1959 Recommendations for minimum performance requirements of mains-operated public address amplifiers
- 1819-1961 Recommendations for general requirements of public address amplifiers
- 1881-1961 Code of practice for installation of indoor amplifying and sound distribution systems
- 1882-1962 Code of practice for outdoor installation of public address system
- 1885 Electrotechnical vocabulary:
 - (Part III/Sec 1)-1965 Physical acoustics
 - (Part III/Sec 2)-1966 Acoustical and electro-acoustical systems
 - (Part III/Sec 4)-1966 Sonics, ultrasonics and underwater acoustics
 - (Part III/Sec 5)-1966 Speech and hearing
 - (Part III/Sec 6)-1967 Acoustical instruments
 - (Part III/Sec 7)-1978 Music
 - (Part III/Sec 8)-1974 Architectural acoustics
- 2032 (Part XII)-1969 Graphical symbols used in electro-technology: Part XII
 - Electro-acoustic transducers and recording and reproducing systems
- 2264-1963 Preferred frequencies for acoustical measurements
- 2382-1970 Recommended mounting dimensions of loudspeakers (*first revision*)
- 3028-1965 Methods of measurements of noise emitted by motor vehicles
- 3641-1976 Methods of measurement on hearing aids (*first revision*)
- 3931-1966 Sound level meters for the measurement of noise emitted by motor vehicles
- 3932-1966 Sound level meters for general purpose use
- 4242-1967 Method of measurement of acoustical noise emitted by ballasts for gaseous discharge lamps
- 4406-1967 General requirements for hearing aids
- 4482-1967 Hearing aids
- 4755-1968 Reference zero for calibration of puretone audiometers
- 4758-1968 Methods of measurement of noise emitted by machines
- 6098-1971 Methods of measurement of airborne noise emitted by rotating electrical machinery
- 6229-1971 Method of measurement of the real-ear attenuation of ear protectors at threshold
- 6964-1973 Octave, half-octave and third-octave band filters for analysis of sound and vibrations
- 7136-1973 Megaphones
- 7194-1973 Assessment of noise exposure during work for hearing conservation purposes
- 7709-1975 Standard hydrophone
- 7741 (Part I)-1975 Specification for loudspeakers: Part I General requirements and tests
- 7741 (Part II)-1975 Specification for loudspeakers: Part II Direct radiator moving coil loudspeakers
- 7741 (Part III)-1975 Specification for loudspeakers: Part III Pressure unit operated horn loudspeakers
- 7741 (Part IV)-1977 Specification for loudspeakers: Part IV Loudspeakers for community radio receivers
- 8146-1976 Method of measurement of reverberation time in auditoria
- 8159-1976 Scales and sizes for plotting frequency characteristics and polar diagrams
- 8225-1976 Method of measurement of absorption coefficients in a reverberation room
- 9098-1979 Pure tone audiometers
- 9167-1979 Ear protectors
- 9302 (Part I)-1979 Characteristics and methods of measurement for sound system equipment: Part I General
- 9302 (Part II)-1979 Characteristics and methods of measurement for sound system equipment: Part II Amplifiers
- 9302 (Part III)-1979 Characteristics and methods of measurement for sound system equipment: Part III Microphones
- 9671-1980 Frequency weighting for the measurement of aircraft noise (D-weighting)